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Introducing an improved e-exam system with the question highlight/marking feature to diminish the candidate's discomfort

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ABSTRACT

In today's era, almost all exams job-oriented as well as institutional are carried out through computer systems (commonly known as e-exam). This approach is very efficient as it is suitable for large-scale implementation, it is secure, and provide very fast results but it has demerit as candidates feel discomfort in attempting questions because they don't have much control over the question area. They don't highlight or mark the important information of the question. This waste their time in solving complex problems like reasoning puzzles, code snippets etc. In this paper, we introduce a new feature of highlighting the text in the question view-area so that user can mark/highlight the important portion of the question and used it in solving the question quickly. Our demonstration and result analysis show 85% of the students (17 out of 20) find our proposed system useful and more comfortable than the existing system.

Keywords: E-exams System, Computer-based Exams System, Competitive Exams, E-learning.

1. INTRODUCTION

With the development of the computer and network technology, e-learning and e-evaluation environment grows exponentially and now these days, most of the exams whether they are job-oriented (competitive exams like banks, SSC, etc.) or institutional level exams are performed with the help of computers i.e. e-exams. These exams are generally composed of MCQ's (Multiple Choice Questions). E-exams or computer-based exams are more secure, scalable and capable of handling a large number of exam candidates. Also, preparing exam's question paper and its evaluation is way faster than the traditional paper-based exams and this is one of the major advantages of using computer-based exam system [1][2].

Although, e-exams are more superior to the paper-based exams, the student distraction level and ease of comfort in these exams is considerably low as compared to the paper-based exams. The reason behind it is that the candidates are not habitual to e-read (reading from a computer screen) and thus feel discomfort during the exam [3]. But with the passage of time, we all are getting more familiar with e-reading and the discomfort level reduced very rapidly. Another reason behind the discomfort faced by the candidates is that they don't have much control over the question view-area and in this paper, we try to present a solution for this.

2. EVOLUTION OF MCQ'S EXAMS

MCQ's i.e. multiple choice question-based exams are the most popular type of exams used these days. In these exams, candidates are provided with a number of questions. Each question has multiple options and candidate have to choose the correct one. With the enhancement in technology, the way of exercising these exams is changed accordingly. We may divide the whole evolution of MCQ's exams in three phases.

Phase I – Printed paper and manual evaluation

In this phase, question paper is printed on the papers along with the options. Students marked their response by tick-mark /checked the options and the evaluation is done manually by the examiners. This technique is quite a time and man-power consuming and thus not suited for large-scale adoption.

Phase II – Printed paper and OMR based evaluation

In this approach, printed question paper is given to the candidates along with a special paper-sheet known as OMR sheet or bubble sheet. This OMR (Optical Mark Recognition) sheet have circles (bubbles) printed on it for each question and candidate have to fill the desired bubble for answering the question. After that, these sheets are evaluated by a computer with the help of OMR scanner which is capable of reading the response filled in the OMR sheet. This approach is less time consuming as compared to the manual evaluation but it requires more resources (paper, etc.) along with some efficient manpower. Large-scale implementation of this is possible but up to an extent [4]. Also, large-scale implementation is vulnerable to OMR sheet tampering frauds as seen frequently in the previous years. Although there are some techniques through which they are controlled but still very large-scale implementation if this system is not feasible.

Phase III – Computer-based exams or E-exams

In this, the whole exam is carried out through computers. Candidates provided with the computer systems in the exam hall. They see their test paper on the computer's screen. In these type of exams, there is a question view-area where the question is shown to the user. There is an options area where options for the question are shown. Also, many other features like navigation to next question, view attempted questions etc. are present. Candidate can answer the question by selecting the correct option just by clicking the mouse button. All the computers are connected to server computers, these computers store the user responses and evaluate them later. This approach is better to organize exams at large-scale as it is scalable, secure and provide very fast evaluation [1][2].

3. DISCOMFORT ISSUE ON THE EXISTING E-EXAM SYSTEM

Almost in every stream and at any level e-exams are widely used these days. E-exams reduce much load from the exam-organizing bodies as they provide fast evaluation, require less manpower, one-time setup, and easily scalable and secure. But on the other hand, many exam candidates facing difficulties and discomfort when exams are conducted through computer systems. Studies show that the students are more comfortable in pen-paper based exams as compared to e-exams. The reason behind this is that the candidates are not comfortable with e-reading and thus this approach reduce their speed of attempting questions [5]. But now these days we are more onto e-reading and this problem is getting solved. Second and the biggest problem is that the candidate has very less or almost no control over the question view-area in the e-exams. In pen-paper based exams candidates can mark or highlight the important portion of the question by underlining it, but in computer-based exams, candidates cannot do so. This looks very tiny thing but while solving complex problems like reasoning puzzles, analogical or programming problems in the exams where time is at a premium, this little thing make huge difference as in some exams (banks pre-exam etc.) candidates have to answer 100 questions in 60 minutes.

E-exams have these problems but used frequently as it is the most efficient approach for organizing exams at very large scale. Thus, we proposed an approach to reduce the discomfort faced by the candidates by providing them more control over the question view-area.

4. PROPOSED SYSTEM AND ITS IMPLEMENTATION

In our proposed system, we provide more control over the question view-area to the candidate so that they can highlight the desired portion of the question with the help of mouse. The highlighted portion need not be contiguous and remain highlighted until the 'clear highlight' button is clicked which is provided in the question view-area. The candidates can highlight any portion (words, whole statement etc.) of the question containing useful information so that they can use it in solving the questions.

For implementing our proposed system, we set up a Java-based e-exam system having all the features of the existing system and then we add the highlighting feature to the question view-area of the test. For this, we use highlighter and mouse listener's API [6][7]. When the candidate selects the text of the question using the mouse, we came to know about the selection by implementing mouse listener, and then by using Highlighter and HighlightPainter interface, we highlight the selected area. We also introduce a 'clear-highlight' button at the top of the view-area so that the highlighting can be removed. Candidates can also disable this highlighting feature if they want to.

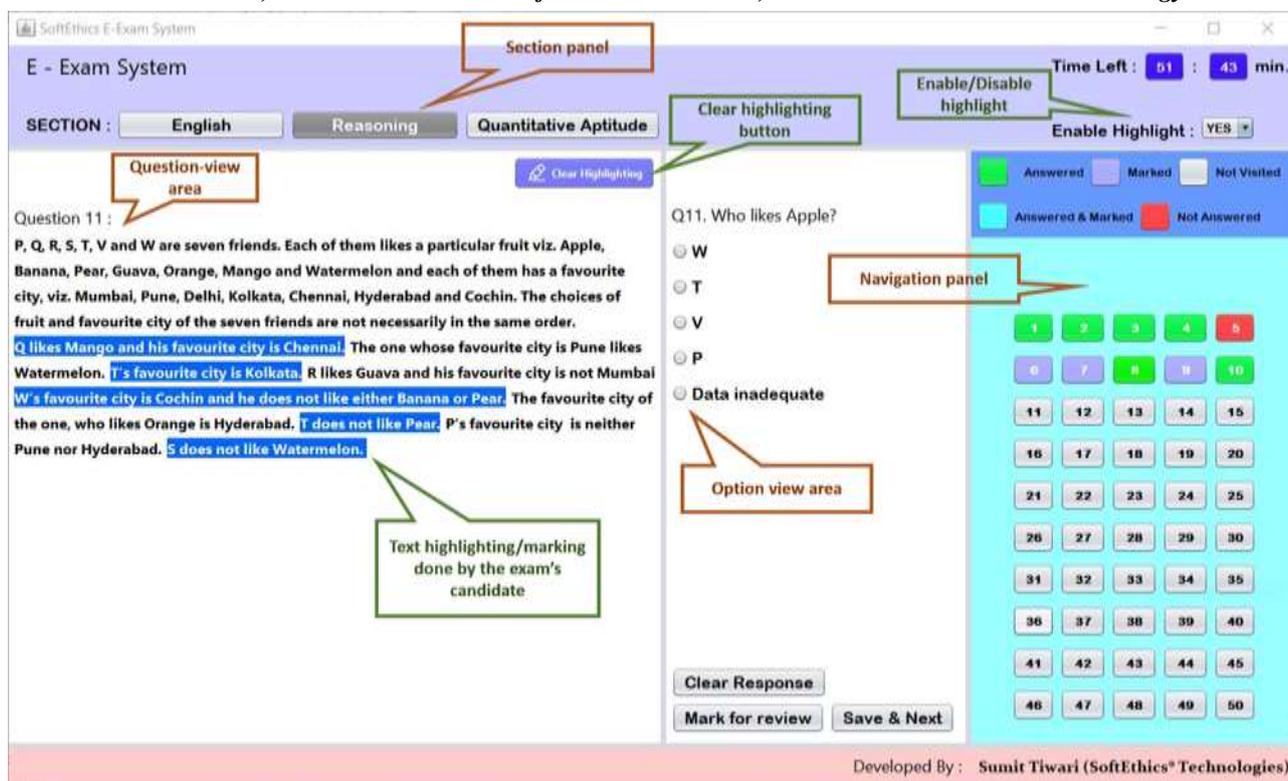


Figure 1. Shows a snapshot of the implemented system

5. DEMONSTRATION AND RESULT ANALYSIS

In order to demonstrate our system and to know whether it is helpful for the candidates of e-exams, we ask 20 students to appear in a test in our proposed system. These students are of different streams, some of them are college students who rarely appear in the MCQ's e-exams and some of them are aspirant preparing for competitive exams like banks, SSC, etc. and appeared in e-exams frequently.

17 out of 20 candidates give positive feedback and says that this enhanced system helps them a lot as they can mark the important points in the question. Some of the bank aspirants also added that this system is quite helpful especially in solving puzzles and arrangement problems of the reasoning and minimize the discomfort up to a greater extent, hence save time.

6. CONCLUSION

In this paper, we try to enhance the existing e-exam system to reduce the discomfort of the exam by providing them the feature of highlighting or marking text of the question, so that they can use it to solve the question. We implement our e-exam system with text highlighting feature in Java and allow some candidates to demonstrate it and 85% of the total candidates find our proposed system helpful, more comfortable and time-saving.

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